



A.D. 1843 N° 9774.

S P E C I F I C A T I O N

OF

FREDERICK WILLIAM EGGLESTON.

APPARATUS FOR ADMITTING AND REGULATING SUPPLY OF AIR TO FURNACES.

L O N D O N :

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**Apparatus for Admitting and Regulating Supply of
Air to Furnaces.**

EGGLESTON'S SPECIFICATION.

TO ALL TO WHOM THESE PRESENTS SHALL COME, I, FREDERICK WILLIAM EGGLESTON, of Derby, in the County of Derby, Confectioner, send greeting.

WHEREAS Her present most Excellent Majesty Queen Victoria, by Her
5 Royal Letters Patent, bearing date at Westminster, the Fifteenth day of June,
(One thousand eight hundred and forty-three,) in the sixth year of the reign,
did, for Herself, Her heirs and successors, give and grant unto me, the said
Frederick William Eggleston, my exors, admors, and assigns, Her especial
licence, full power, sole privilege and authority, that I, the said Frederick
10 William Eggleston, my exors, admors, and assigns, or such others as I, the
said Frederick William Eggleston, my exors, admors, or assigns, should at any
time agree with, and no others, from time to time and at all times during
the term of years therein expressed, should and lawfully might make, use,
exercise, and vend, within that part of Her said Majesty's United Kingdom of
15 Great Britain and Ireland called England, Her Dominion of Wales, and Town
of Berwick upon Tweed, Her Islands of Jersey, Guernsey, Alderney, Sark, and
Man, and also in all Her Majesty's Colonies and Plantations abroad, my Inven-
tion of "IMPROVEMENTS IN THE COMBUSTION OF FUEL AND CONSUMPTION OF SMOKE;"
in which said Letters Patent is contained a proviso that I, the said Frederick
20 William Eggleston, should particularly describe and ascertain the nature of
my said Invention, and in what manner the same is to be performed, by
an instrument in writing under my hand and seal, and cause the same to
be enrolled in Her said Majesty's High Court of Chancery within six calendar
months next and immediately after the date of the said in part recited Letters

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Patent, as in and by the same, reference being thereunto had, will more fully and at large appear.

NOW KNOW YE, that in compliance with the said proviso, I, the said Frederick William Eggleston, do hereby declare the nature of my said Invention, and in what manner the same is to be performed, to be particularly 5 described and ascertained in and by the following statement thereof, reference being had to the Drawings hereunto annexed, and to the figures and letters marked thereon.

It is well known that in the combustion of fuel, as generally practised, a large portion of gaseous and inflammable matter passes away in an unconsumed 10 state, whereby not only is the heating or calorific effect of that portion of the fuel wholly lost, but dense smoke and soot is the result of the inflammable carbonaceous matter so passing away unconsumed. Now the object of my said improvements is to render the heat which may be derived from the inflammable and carbonaceous gaseous matter so passing away in the combustion of fuel 15 useful and available for heating purposes, and to consume or prevent the production of the smoke which will otherwise be produced if the said matter be not so usefully employed. And I effect this object by causing the atmospheric air to become intimately blended with the combustible and volatile or gaseous matter generated and evolved in the combustion of the fuel, such intimate 20 blending being ensured by the division of the streams of air injected into the said gaseous matter when the air is supplied to the said gases through wire gauze, or gauze wire, and certain arrangements connected therewith. And in order to explain my said Invention as completely as possible I will proceed to describe the arrangement of parts which I consider well calculated for that purpose, and for carrying out my said Invention, and which 25 will be found to answer extremely well. The metallic gauze, when used at the mouth of the furnace, and serving as the door thereof or opening for supplying coals thereto, I construct and arrange in manner following: To the framing of the door or opening I make fast the wire gauze in any convenient manner, and 30 I regulate the quantity of air which is to pass through the gauze for effecting the combustion of the fuel and gases evolved therefrom, by means of plates having openings, and so arranged as to slide over one another, the plate nearest the gauze (which it should not touch) being fixed to the framing of the door or opening, and the other allowed to slide freely across it so as to increase or 35 diminish the area of the openings in the plates through which the atmospheric air has to pass to the gauze, consequently increasing or diminishing the supply of air as required; or I employ an ordinary regulator for the same purpose. Another mode of carrying out my said Invention is by constructing the furnace

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door of wire gauze peculiarly woven, that is to say, in lieu of using gauze, the meshes of which are of equal area, or nearly so, throughout, I employ gauze so constructed as that the meshes thereof shall vary in area at distances of about four inches asunder, so that if the furnace door be twenty-four inches deep

5 there will be six different strata of gauze, which may be raised or lowered as found necessary for the purpose of admitting a larger or smaller quantity of air to the fire, as required. The gauze, when applied to the bridge of the furnace, has the air supplied through openings situate at each side of the furnace, or from the ash pit through openings made in the brickwork of the "bridge;"

10 (these air flues may be used conjointly (or separately), the said openings being furnished with dampers for regulating the quantity of air admitted); also the gauze may be applied to supply air at the side of a furnace by any convenient openings. Instead of employing a fine gauze, the following mode of dividing the atmospheric air admitted to the gases in furnaces may be adopted: I place

15 two or more pieces of wire gauze of the ordinary construction (of any texture) against each other, one of such pieces being firmly fixed to the aperture through which the air is to be admitted, and the other, or others, so arranged as to be capable of being slidden freely across each, whereby the atmospheric air will be divided according to the size, number, and arrangement of the pieces of gauze

20 employed, three of which I consider sufficient for general purposes. And I would observe that by these means the air may be caused to enter in extremely small films or streams, although the gauze employed may have meshes of a large size; the only thing to be attended to is that the wires of the meshes must overlay and intersect the meshes.

25

DESCRIPTION OF THE DRAWINGS.

Figure 1 represents a front elevation of a furnace, the door of which is peculiarly constructed as above described. Figure 2, a transverse section of the furnace taken through the line A, B, (see Plan,) shewing the construction of the "bridge" and mode of admitting air thereto, the course of which is

30 denoted by the arrow's flight. Figure 3, a longitudinal sectional elevation of a furnace taken through the line C, D, (see Plan). Figure 4, a sectional plan view of a furnace, taken through the line E, F, in Figure 2. Figures 5, 6, 7, several views of a furnace door and regulator, with wire gauze attached thereto; Figure 5 being a front elevation thereof; Figure 6, an elevation thereof,

3 shewing the front plate slidden over the back one so as to partially cover the holes through which the air has to pass; Figure 7, an edge view thereof. Figure 8, a back elevation of the door, shewing the wire gauze. Figure 9, a front elevation of a furnace door constructed with an ordinary regulator, having

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wire gauze attached thereto. Figure 10 shews the peculiar construction of the wire gauze herein-before mentioned, for the double purpose of dividing and regulating the supply of air. Similar letters are placed upon corresponding parts in all the figures. A, A, represents the furnace door; B, the sliding plate; C, gauze wire; D, "bridge" of furnace, which is constructed hollow, as 5 shewn at Figures 3 and 4; E, air flues (shewn by dotted lines) situated at the sides of the furnace and communicating with the hollow bridge; F, air flues situated in front of the bridge, communicating therewith, and employed more particularly in cases where the side flues E cannot conveniently be constructed. I would observe that in the management of furnaces or fires, so as to obtain 10 my said improvements in the combustion of fuel and consumption of smoke, the air to be admitted to the fire through the bars should be regulated according to what is required for the proper burning of the fire, and that the air admitted through the gauze must be regulated according to that which is required for effecting the combustion of the carbonaceous, volatile, or gaseous 15 matter, and preventing the same passing away as smoke; and that, provided sufficient air be supplied in the manner aforesaid for effecting this object, any excess of air beyond what is necessary for that purpose tends to cool the gases unnecessarily.

Having now described the nature of my said Invention, and in what manner 20 the same is to be performed, I wish it to be distinctly understood that I am perfectly aware of various modes having been employed for supplying air in small jets or films to the gaseous or volatile products of the fuel, and from sources independent of the ash pits of the furnaces in which the fuel is consumed. I do not therefore claim as of my Invention, or the exclusive use of 25 any of the separate parts or arrangements herein-before described or referred to for supplying the air in jets or films, and from such independent sources, except when the same may be employed in connection with my said Invention, which I hereby declare to consist in the improvements in the combustion of fuel and consumption of smoke to be effected by supplying the air to the 30 volatile gaseous parts of the fuel through one or more pieces of woven wire or wire gauze, the said gauze having meshes of such size, or the said meshes being so arranged overlaying each other as to cause the air to become mixed with the said gaseous matter in extremely small and minutely divided jets or films, as above described.

In witness whereof, I, the said Frederick William Eggleston, have here-
unto set my hand and seal, the Fourteenth day of December, in the
year of our Lord One thousand eight hundred and forty-three.

FRED^K WILL^M (L.S.) EGGLESTON.

FIG. 1.

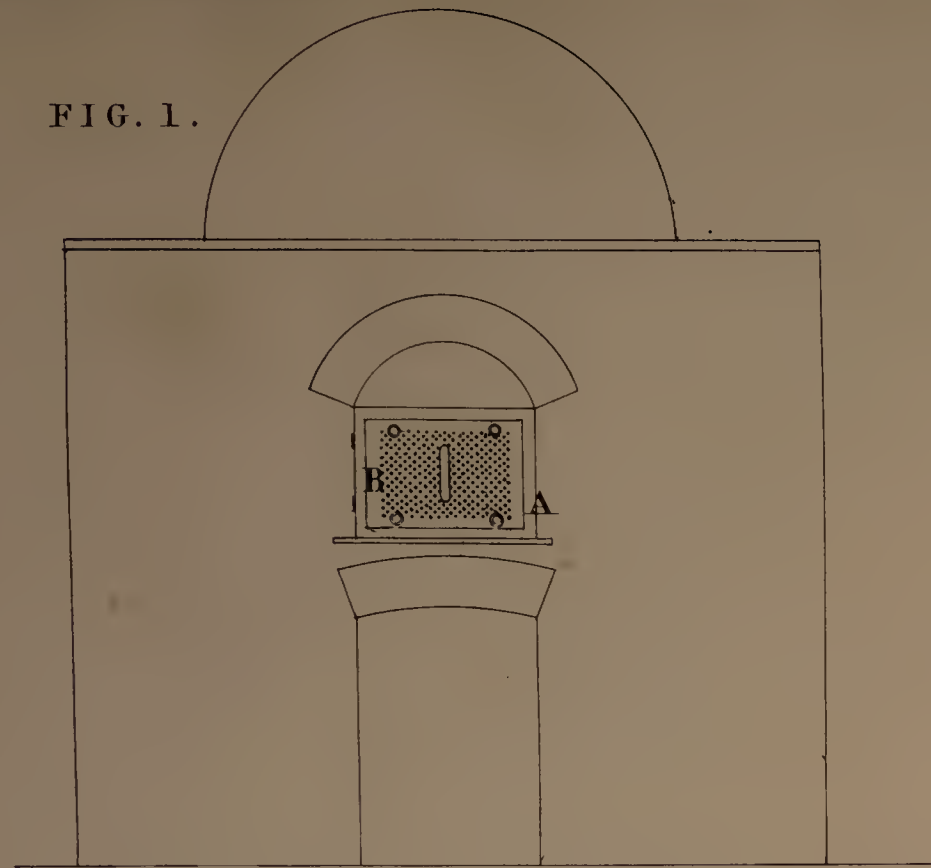


FIG. 2.

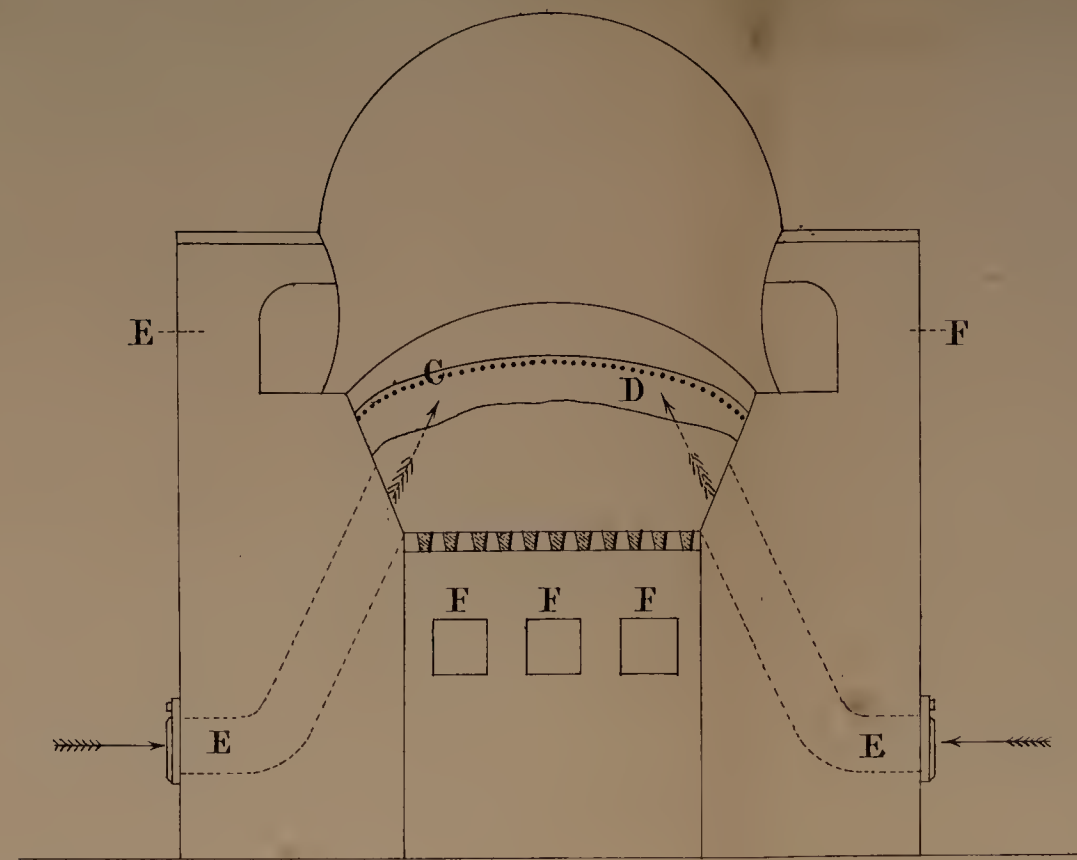


FIG. 3.

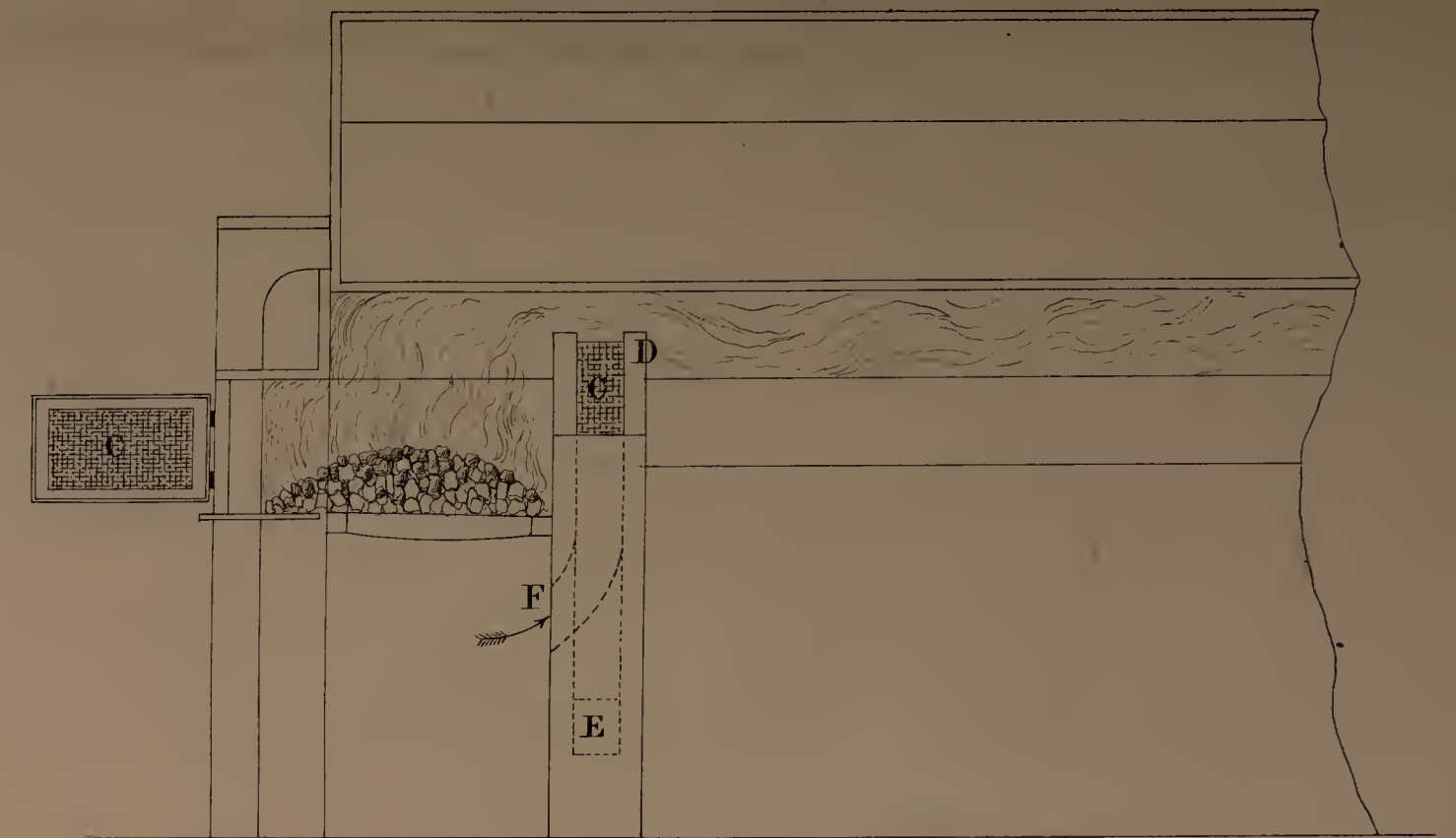


FIG. 5.

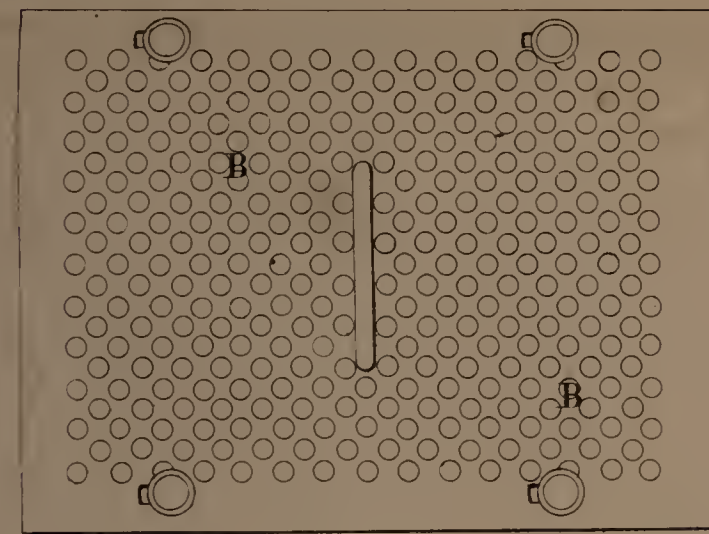


FIG. 7.

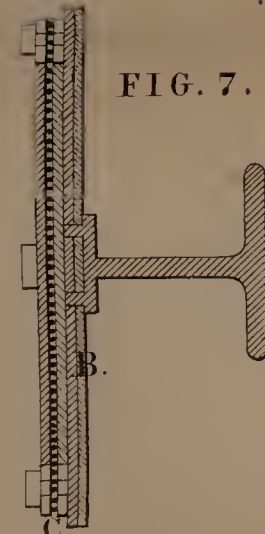


FIG. 8.

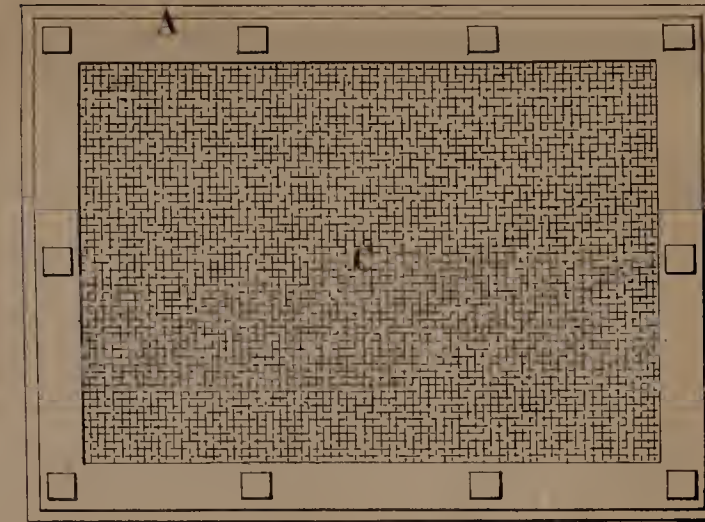


FIG. 10.

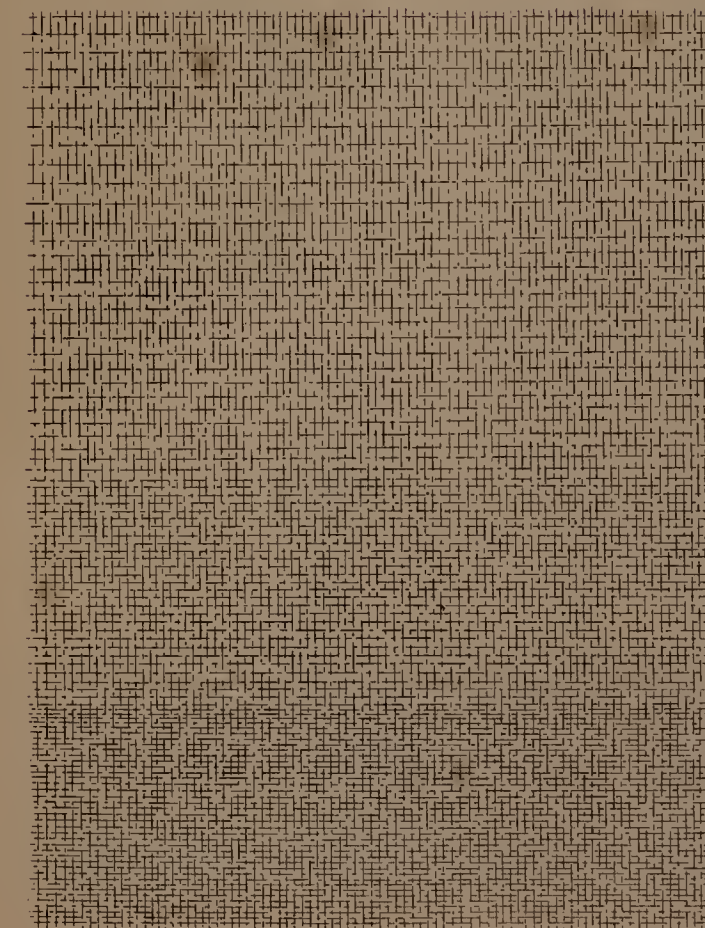


FIG. 6.

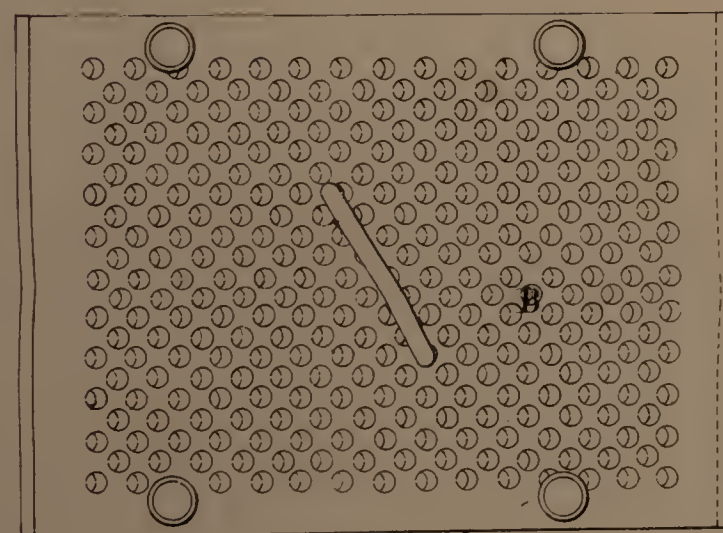


FIG. 9.

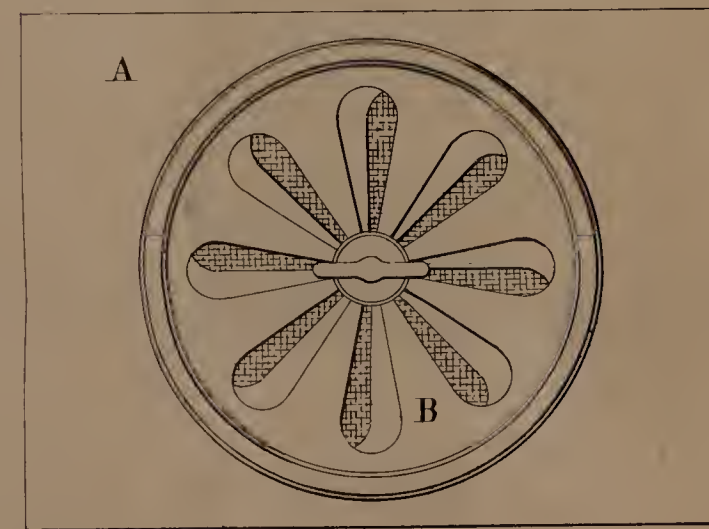
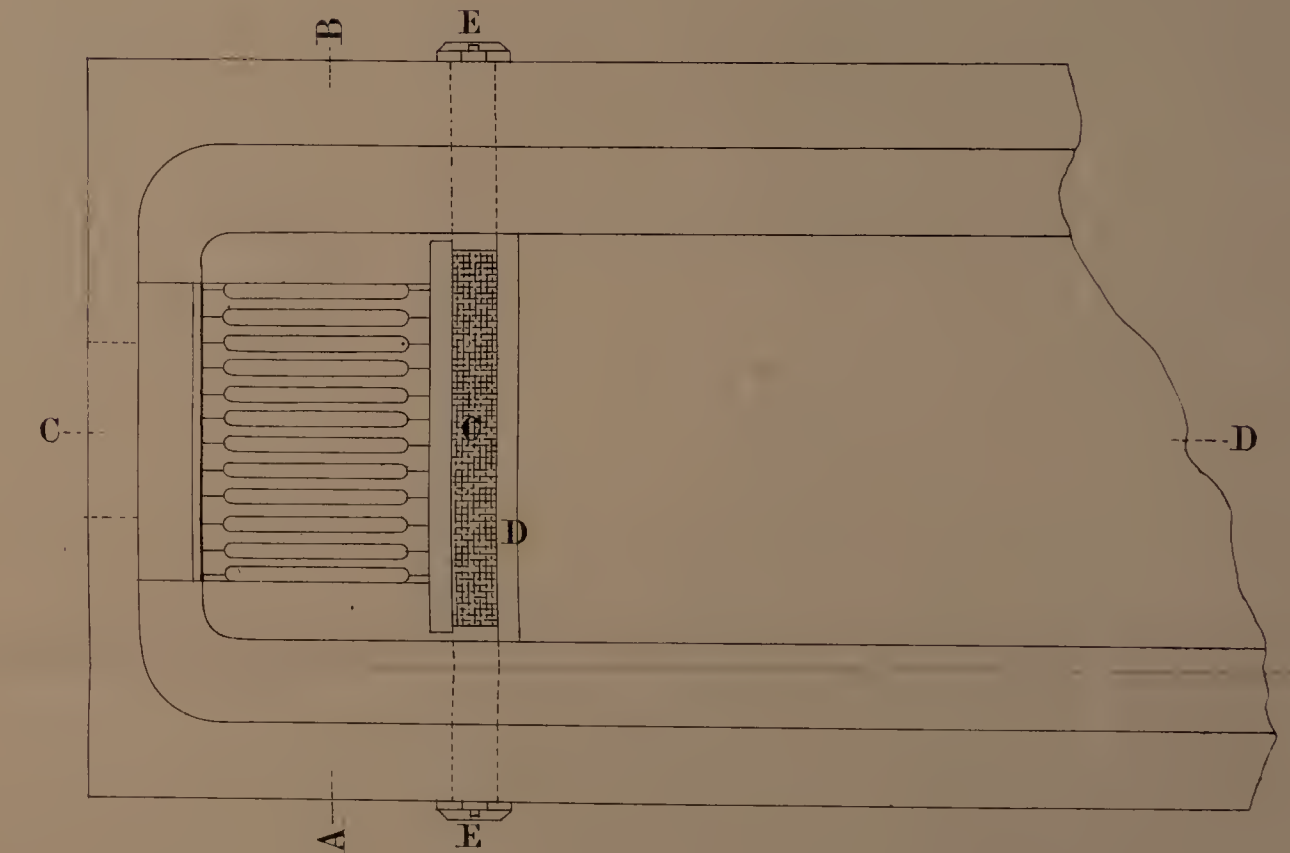


FIG. 4.



The Enrolled Drawing is partly colored.



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Eggleston's Impts. in the Combustion of Fuel and Consumption of Smoke.

AND BE IT REMEMBERED, that on the Fourteenth day of December, in the year of our Lord 1843, the aforesaid Frederick William Eggleston came before our said Lady the Queen in Her Chancery, and acknowledged the Specification aforesaid, and all and every thing therein contained and 5 specified, in form above written. And also the Specification aforesaid was stamped according to the tenor of the Statute made for that purpose.

Enrolled the Fifteenth day of December, in the year of our Lord One thousand eight hundred and forty-three.

LONDON :

Printed by GEORGE EDWARD EYRE and WILLIAM SPOTTISWOODE,
Printers to the Queen's most Excellent Majesty. 1854.

